

CALCULATING THE EMPLOYMENT COST INDEX (ECI)

How can you calculate the ECI? The formula and three examples below, using both the 2002 North American Industry Classification System (NAICS) and the 1987 Standard Industrial Classification (SIC) system tables, will help you convert current and historical wages into constant (or inflation-adjusted) wages.

Method to Calculate ECI:

The ECI can be calculated by using the following equation for different time periods (in the examples below, both 1995 and 2000 and 2001 and 2005):

$$AF = (AIE_{05} / AIB_{01})$$

- $RW = AF * AE$

where

AF = Adjustment factor

AIE = Annual index ending value (ending quarter or annual)

AIB = Annual index beginning value (beginning quarter or annual)

RW = Real wages

AE = Average earnings

The examples below demonstrate both a NAICS-based calculation as well as a SIC-based calculation. In making comparisons over the years, which table, NAICS or SIC, should be used? Because the NAICS coding system took effect in 2001, and is the most up-to-date industry classification system, we recommend using NAICS-based tables for comparisons from 2001 forward. Prior to 2001, we recommend using the SIC-based table.

Example 1: How to convert current wages to constant (inflation-adjusted) wages using ECI (NAICS Based)

Let's suppose:

| | |
|--|--------------------------|
| Average earnings for Western Region workers for 2001 | = \$100.00 |
| ECI for 2001 for Western Region workers (Table 1) | = 88.78 |
| ECI for 2005 for Western Region workers (Table 1) | = 99.33 |
| Adjustment Factor | = 99.33/88.78 = 1.12 |
| Adjusted wages for 2005 using 2001 as base | = 100*1.12 = \$112.00 |

Or to put it another way, a worker earning, or an employer paying, an average wage of \$100 a day in 2001 would have to earn or pay \$112 a day in 2005 to equal the \$100 earned or paid in 2001.

| Table 1: Employment Cost Index for Private Industry Workers, not seasonally adjusted (December 2005=100) Wages and Salaries, West Region | | | | | |
|--|-------------|-------------|-------------|--------------|---------------|
| Year | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Annual |
| 2001 | 87.4 | 88.3 | 89.2 | 90.2 | 88.78 |
| 2002 | 90.4 | 91.5 | 92.0 | 92.4 | 91.58 |
| 2003 | 93.0 | 93.9 | 95.1 | 95.5 | 94.38 |
| 2004 | 96.4 | 97.0 | 97.7 | 98.0 | 97.28 |
| 2005 | 98.4 | 99.3 | 99.6 | 100.0 | 99.33 |
| 2006 | 100.7 | 102.1 | 102.7 | | |
| The 'West' region is composed of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. | | | | | |

Source: http://www.bls.gov/xg_shells/ro9xg04.htm

Example 2: How to convert current wages to constant (inflation-adjusted) wages using ECI (SIC Based)

Let's suppose:

Average earnings for all workers for 1995 = \$100.00

ECI for 1995 for all workers (Table 2) = 71.53

ECI for 2000 for all workers (Table 2) = 85.65

Adjustment Factor = 85.65/71.53
= 1.20

Adjusted wages for 2000 using 1995 as base = 100*1.20

= \$120.00

| Table 2: Employment Cost Index for Private Industry Workers, not seasonally adjusted (December 2005=100) Wages and Salaries, All Regions | | | | | |
|---|-------------|-------------|-------------|-------------|---------------|
| Year | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Annual |
| 1989 | 58.1 | 58.7 | 59.4 | 59.9 | 59.03 |
| 1990 | 60.6 | 61.3 | 61.9 | 62.3 | 61.53 |
| 1991 | 63.0 | 63.6 | 64.1 | 64.6 | 63.83 |
| 1992 | 65.1 | 65.5 | 65.8 | 66.3 | 65.68 |
| 1993 | 66.8 | 67.3 | 67.9 | 68.3 | 67.58 |
| 1994 | 68.8 | 69.3 | 69.9 | 70.2 | 69.55 |
| 1995 | 70.8 | 71.3 | 71.8 | 72.2 | 71.53 |
| 1996 | 73.0 | 73.7 | 74.2 | 74.7 | 73.90 |
| 1997 | 75.5 | 76.1 | 76.9 | 77.6 | 76.53 |
| 1998 | 78.5 | 79.2 | 80.2 | 80.6 | 79.63 |
| 1999 | 81.0 | 82.0 | 82.7 | 83.5 | 82.30 |
| 2000 | 84.4 | 85.3 | 86.2 | 86.7 | 85.65 |
| 2001 | 87.7 | 88.6 | 89.3 | 90.0 | 88.90 |
| 2002 | 90.8 | 91.7 | 92.1 | 92.4 | 91.75 |
| 2003 | 93.5 | 94.1 | 94.9 | 95.2 | 94.43 |
| 2004 | 95.9 | 96.5 | 97.4 | 97.5 | 96.83 |
| 2005 | 98.2 | 98.8 | 99.5 | 100 | 99.13 |

Source: <http://www.bls.gov/ncs/ect/home.htm>

Note: On the above page, scroll down to “Create Customized Tables (multiple screens) and select SIC basis.

Example 3: How to adjust reported wages using ECI (NAICS Based-West Region)

Now, let’s suppose that we already have the wages paid over a certain period and want to adjust them for inflation. In Table 3, the second column represents total actual wages paid during the four quarters of the calendar year. The fourth and fifth columns adjust the wages based on constant dollars for 2001 and 2005 by using these formulas.

Adjusting wages using 2001 constant dollars: $\text{Index 2001/Index 2005} = \text{Deflated value}$. In our example in Table 3, we calculate column four figures based on 2001 constant dollars. To calculate the 2005 figure, we divide 88.78 by 99.33 and multiply that result (.8937883) by the actual wages paid in 2005 (\$650,000) to get a deflated or inflation-adjusted result of \$580,962 for 2005. To calculate 2004 inflation-adjusted dollars, you divide 88.78 by 97.28 and multiply that result by \$550,000.

Adjusting wages using 2005 constant dollars: $\text{Index 2005/Index 2001} = \text{Inflated value}$. In this example, we use 2005 dollars to calculate (and inflate) prior years’

numbers. To calculate 2001 wages, we divide 99.33 by 88.78 and multiply the result (1.118833) by \$450,000 to get the inflation-adjusted total of \$503,475 for 2001, based on 2005 constant dollars. For 2002, you would divide 99.33 by 91.58 and multiply the result by \$480,000.

| Table 3: Adjusting Wages Based on Constant Dollars | | | | |
|---|-------------------|--------------|---------------------|---------------------|
| Year | Wages Paid | Index | 2001 Dollars | 2005 Dollars |
| 2001 | 450,000 | 88.78 | 450,000 | 503,475 |
| 2002 | 480,000 | 91.58 | 465,324 | 520,620 |
| 2003 | 525,000 | 94.38 | 493,849 | 552,535 |
| 2004 | 550,000 | 97.28 | 501,943 | 561,590 |
| 2005 | 650,000 | 99.33 | 580,962 | 650,000 |